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# INTERNATIONAL STANDARD



# 1773

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Laboratory glassware — Boiling flasks (narrow-necked)

*Verrerie de laboratoire — Fioles coniques et ballons (à col étroit)*

First edition — 1976-08-01

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[ISO 1773:1976](#)

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**Descriptors** : laboratory glassware, flasks, conical flasks, specifications, dimensions.

Price based on 3 pages

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 48 has reviewed ISO Recommendation R 1773 and found it technically suitable for transformation. International Standard ISO 1773 therefore replaces ISO Recommendation R 1773-1970 to which it is technically identical.

<https://standards.iteh.ai/catalog/standards/sist/ac3a499c-f729-4824-a5f8-266ac06b0c0c/iso-1773-1970>

ISO Recommendation R 1773 was approved by the Member Bodies of the following countries :

Austria	India	Poland
Belgium	Iran	South Africa, Rep. of
Canada	Israel	Spain
Colombia	Italy	Thailand
Czechoslovakia	Korea, Dem. P. Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zealand	U.S.S.R.
Greece	Peru	Yugoslavia

The Member Bodies of the following countries expressed disapproval of the Recommendation on technical grounds :

Germany\*  
U.S.A.

\* Subsequently, this Member Body approved the Recommendation.

No Member Body disapproved the transformation of ISO/R 1173 into an International Standard.

# Laboratory glassware – Boiling flasks (narrow-necked)

## SECTION ONE : CONICAL FLASKS

### 1 SCOPE AND FIELD OF APPLICATION

Section one of this International Standard specifies requirements for an internationally acceptable series of conical flasks for general laboratory purposes. It is intended to provide useful guidance for new construction and it is hoped that present construction will be brought into line as soon as possible.

### 2 REFERENCES

ISO/R 718, *Methods for thermal shock tests on laboratory glassware.*

ISO/R 719, *Determination of the hydrolytic resistance of glass grains at 98 °C.*

### 3 SERIES OF CAPACITIES

The series of nominal capacities of conical flasks is as follows :

25 – 50 – 100 – 250 – 500 –  
1 000 – 2 000 – 3 000 – 5 000 ml

### 4 CAPACITY

The nominal capacity of a flask is the value, selected from the series in clause 3, which is closest to, but not ~~less~~ <sup>larger</sup> than, the actual capacity to the base of the neck.

NOTE – The body dimensions recommended in table 1 take this requirement into account, and accord as far as possible with the current production of flasks.

### 5 MATERIAL

#### 5.1 General

Flasks shall be made from borosilicate glass of suitable chemical and thermal properties, shall be as free as possible from visible defects and shall be reasonably free from internal strain.

#### 5.2 Hydrolytic resistance

When the glass is tested in accordance with ISO/R 719, the amount of alkali extracted, expressed as Na<sub>2</sub>O, shall not be greater than 25 µg per gram of glass.

#### 5.3 Thermal shock resistance

The glass shall have a maximum coefficient of linear thermal expansion of  $5,5 \times 10^{-6} / ^\circ\text{C}$  over the temperature range 20 to 300 °C.

NOTE – If information is required by the purchaser on the thermal shock resistance of flasks of any particular size and wall thickness, a test should be carried out in accordance with ISO/R 718. The temperature differential to be applied in the test, and also any necessary amendments in the test procedure resulting from the size of the flask, should be the subject of agreement between the interested parties.

### 6 CONSTRUCTION

#### 6.1 Stability

The flasks shall stand vertically without rocking or spinning when placed on a level surface.

#### 6.2 Neck

The neck of the flask shall be substantially circular in cross-section and the mouth of the neck shall not be belled to any considerable distance from the top. The top of the neck shall be suitably strengthened.

**7 DIMENSIONS**

**7.1 Recommended dimensions**

Recommended dimensions for conical flasks are given in table 1.

TABLE 1 – Recommended dimensions for conical flasks

Dimensions in millimetres

Nominal capacity ml	External diameter of body at widest point	External diameter of neck	Overall dimensions	Minimum wall thickness (see 7.4)
25	42 ± 1	22 ± 1	70 ± 3	0,8
50	51 ± 1	22 ± 1	85 ± 3	0,8
100	64 ± 1,5	22 ± 1	105 ± 3	0,8
250	85 ± 2	34 ± 1,5	140 ± 3	0,9
500	105 ± 2	34 ± 1,5	175 ± 4	0,9
1 000	131 ± 3	42 ± 2	220 ± 4	1,3
2 000	166 ± 3	50 ± 2	280 ± 4	1,5
3 000	187 ± 3	50 ± 2	310 ± 5	1,8
5 000	220 ± 3	50 ± 2	365 ± 5	1,8

NOTE — Manufacturers shall take care that minimum wall thicknesses are compatible with safety requirements.

**7.2 Neck length**

The length of the neck should be 1 to 1,25 times the external diameter of the neck.

**7.3 Dimensions of base**

The radius at the junction between the base and the side of flask should be between 15 and 20 % of the maximum external diameter.

**7.4 Wall thickness**

Recommended minimum values for the wall thickness are given in table 1. Substantial local irregularities should be avoided.

**8 INSCRIPTIONS**

The following inscriptions shall be permanently and legibly marked on all conical flasks :

- a) the nominal capacity of the flask, for example "100 ml" (or "100");
- b) the maker's or vendor's name or mark.

Each flask shall also bear an area with a surface suitable for marking with pencil.

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**SECTION TWO : FLAT BOTTOM AND ROUND BOTTOM FLASKS**

**9 SCOPE AND FIELD OF APPLICATION**

Section two of this International Standard specifies requirements for an internationally acceptable series of flat bottom and round bottom flasks for general laboratory purposes. It is intended to provide useful guidance for new constructions and it is hoped that present construction will be brought into line as soon as possible.

**10 REFERENCES**

ISO/R 718, *Methods for thermal shock tests on laboratory glassware.*

ISO/R 719, *Determination of the hydrolytic resistance of glass grains at 98 °C.*

**11 SERIES OF CAPACITIES**

The series of nominal capacities of flat bottom and round bottom flasks is as follows :

- 50 – 100 – 250 – 500 – 1 000 –
- 2 000 – 4 000 – 6 000 – 10 000 ml

**12 CAPACITY**

The nominal capacity of a flask is the value, selected from the series in clause 11, which is closest to, but not ~~less~~ **larger** than, the actual capacity to the base of the neck.

NOTE — The body dimensions recommended in table 2 take this requirement into account, and accord as far as possible with the current production of flasks.

## 13 MATERIAL

### 13.1 General

Flasks shall be made from borosilicate glass of suitable chemical and thermal properties, shall be as free as possible from visible defects and shall be reasonably free from internal strain.

### 13.2 Hydrolytic resistance

When the glass is tested in accordance with ISO/R 719, the amount of alkali extracted, expressed as  $\text{Na}_2\text{O}$ , shall not be greater than 25  $\mu\text{g}$  per gram of glass.

### 13.3 Thermal shock resistance

The glass shall have a maximum coefficient of linear thermal expansion of  $5,5 \times 10^{-6}/^\circ\text{C}$  over the temperature range 20 to 300  $^\circ\text{C}$ .

NOTE — If information is required by the purchaser on the thermal shock resistance of flasks of any particular size and wall thickness, a test should be carried out in accordance with ISO/R 718. The temperature differential to be applied in the test, and also any necessary amendments in the test procedure resulting from the size of the flask, should be the subject of agreement between the interested parties.

## 14 CONSTRUCTION

### 14.1 Stability

The flat bottom flasks shall stand vertically without rocking or spinning when placed on a level surface.

### 14.2 Neck

The neck of the flask shall be substantially circular in cross-section and the mouth of the neck shall not be belled to any considerable distance from the top. The top of the neck shall be suitably strengthened.

## 15 DIMENSIONS

### 15.1 Recommended dimensions

Recommended dimensions for flat bottom and round bottom flasks are given in table 2.

### 15.2 Dimensions of base

The diameter of the base of a flat bottom flask should be approximately 50 % of the maximum external diameter.

### 15.3 Wall thickness

Recommended minimum values for the wall thickness are given in table 2. Substantial local irregularities should be avoided.

## 16 INSCRIPTIONS

The following inscriptions shall be permanently and legibly marked on all flat bottom and round bottom flasks :

- ISO 1773:1976 a) the nominal capacity of the flask, for example "100 ml" (or "100")  
 https://standards.iteh.ai/catalog/standards/sist/ac5a199c-1109-4624-2518-263aac06c515/iso-1773-1976 b) the maker's or vendor's name or mark.

Each flask shall also bear an area with a surface suitable for marking with pencil.

TABLE 2 — Recommended dimensions for flat bottom and round bottom flasks

Dimensions in millimetres

Nominal capacity ml	External diameter of body at widest point	External diameter of neck	Overall height			Minimum wall thickness (see 15.3)
			Flat bottom	Round bottom	Tolerance	
50	51 ± 1	22 ± 1	100	105	± 3	0,8
100	64 ± 1,5	22 ± 1	110	115	± 3	0,8
250	85 ± 2	34 ± 1,5	140	145	± 3	0,9
500	105 ± 2	34 ± 1,5	170	175	± 4	0,9
1 000	131 ± 3	42 ± 2	200	210	± 4	1,3
2 000	166 ± 3	50 ± 2	250	260	± 4	1,5
4 000	207 ± 3	50 ± 2	300	315	± 5	1,8
6 000	236 ± 3	65 ± 2,5	340	355	± 5	1,8
10 000	279 ± 4	65 ± 2,5	400	420	± 6	2,0

NOTE — Manufacturers shall take care that minimum wall thicknesses are compatible with safety requirements.

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